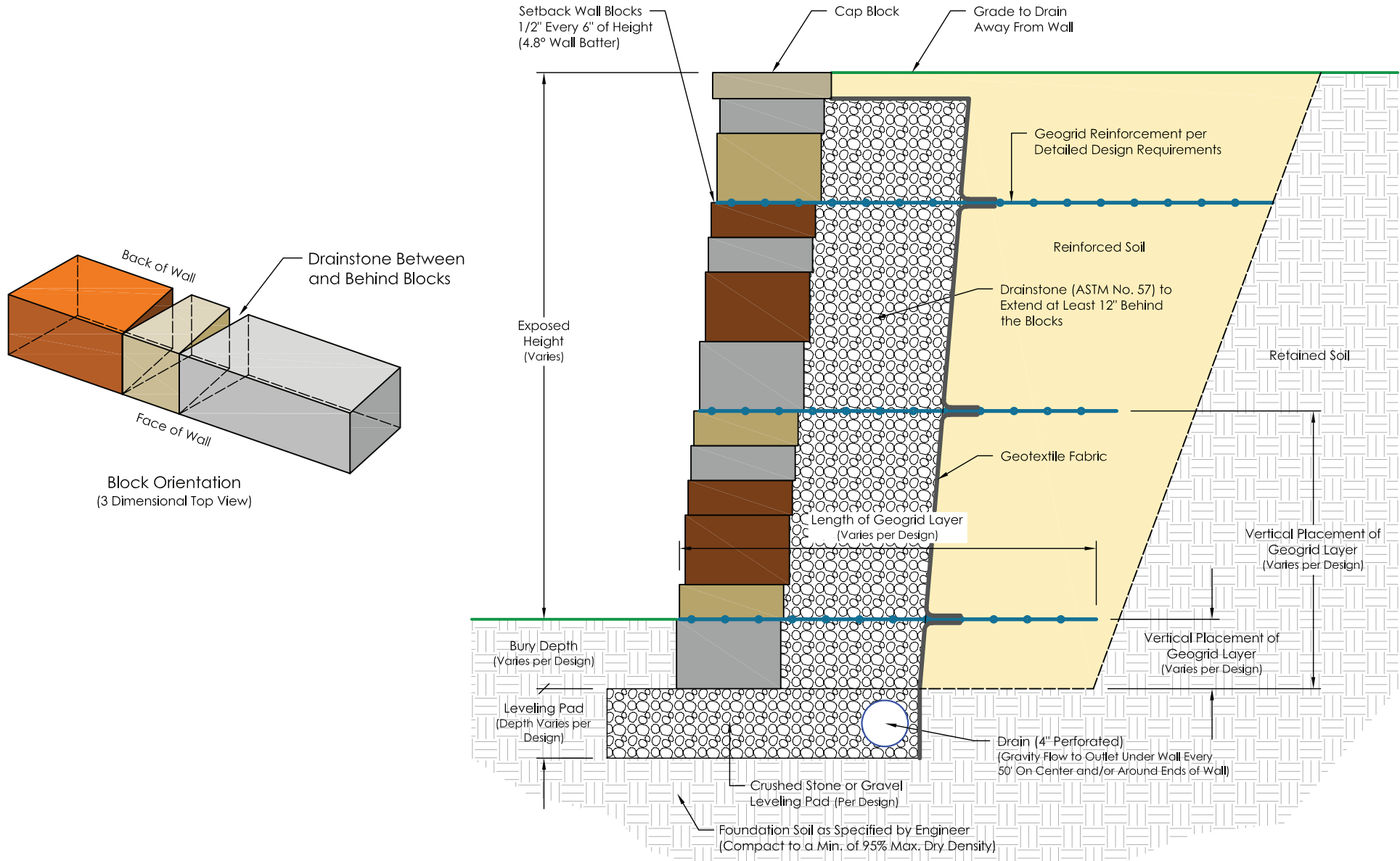


TYPICAL RETAINING WALL CONSTRUCTION DETAILS

This page shows typical construction details for Belvedere retaining walls. These drawings are representative of major components required in wall construction. Specific details including geotextile reinforcement layers, drainage details, soil requirements, etc. shall be per the engineered design for the wall.



- This drawing is for reference only.
- Final designs for construction must be prepared by a registered Professional Engineer using the actual conditions of the proposed site.
- Final wall design must address both internal and external drainage and shall be evaluated by the Professional Engineer who is responsible for the wall design.
- Block sizes and placement shown are for reference only. Individual Belvedere blocks will vary with installation pattern.

BELVEDERE RETAINING WALL INSTALLATION NOTES

1. Review all plans and specifications for the project. Make sure you understand the detailed design for the project before starting construction.
2. Footing excavation should be to the depth shown in the engineered plans for the wall, but at least 6" (150 mm) below the elevation of the bottom block in the wall.
3. Footing excavation width should be a minimum of 27" (690 mm), which will provide 6" (150 mm) in front of and 12" (300 mm) behind the bottom block.
4. Existing soil sub-grade should be compacted to a minimum of 95% maximum dry density before foundation material is introduced. Sub-grade soil should be firm native soil, dry and stable. Consult a soils engineer if in doubt.
5. Place leveling pad material as specified in the wall design. Compact using a vibrator plate compactor.
6. Install a 4" (100 mm) diameter perforated drain pipe in the lowest portion of the free-draining stone, either on the bottom of the crushed stone leveling pad or immediately on top of the slow-draining road gravel leveling pad, depending on the detailed design. Daylight the drain pipe at the ends and/or through the face of the wall to allow for drainage.
7. Walls shall have the bottom course(s) buried to the depth shown on the engineered design. A minimum depth of 6" (150 mm) is required for all walls.
8. Place the bottom course of wall blocks. Take care to level the blocks both parallel and perpendicular to the wall.
9. Backfill the first 12" (300 mm) behind the blocks and triangle shaped areas between the blocks with ASTM No. 57 drainstone. Place a layer of non-woven geotextile fabric immediately behind the drainstone and then place the retained or reinforced soil.
10. Drainstone and backfill shall be placed in maximum 6" (150 mm) lifts and compacted to a minimum of 95% maximum dry density. Hand compaction with a vibratory plate compactor shall be used within 3' (1 m) of the retaining blocks.
11. Place successive units, drainstone, and compacted backfill to the desired grade/ wall height.
12. The top of wall must be graded to direct surface water away from the wall.
13. Coping layer should be adhered with a concrete adhesive.
14. For certain applications, adhesive can be applied on every layer of blocks to help provide additional stability of the blocks.

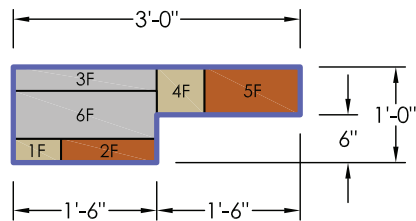
ADDITIONAL REQUIREMENTS FOR GEOGRID INSTALLATION (If Required)

14. Geogrid layers shall be installed to the lengths and elevations detailed in the wall design.
15. Geogrid shall be placed starting at the face of the retaining block and extending into the reinforced soil. Take care to install the geogrid with the strong direction (roll direction) into the reinforced soil zone and not parallel to the wall.
16. Pull the geogrid taut to eliminate any folds and pretension the geogrid. Pin or secure the back edge of the geogrid before placing the reinforced fill.
17. Place and compact the reinforced fill starting at the back of the blocks and continuing back into the retained soil. Backfill shall be placed in maximum 6" (150 mm) thick layers and compacted to 95% maximum dry density. Hand compaction with a vibratory plate shall be used within 3 feet (1 m) of the retaining wall blocks.
18. Tracked construction equipment shall not be used directly on the geogrid. A minimum of 6" (150 mm) of fill is required between tracked equipment and geogrid to prevent damage to the grid. Rubber- tired equipment may pass over the geogrid when traveling at low speeds of 5 mph (8 km/h) or less.
19. Avoid any sudden stopping or turning of construction equipment in the reinforced fill zone to prevent moving or damaging the geogrid layers.
20. Follow geogrid manufacturer's requirements, including requirements for vertical separation and overlap of geogrid.

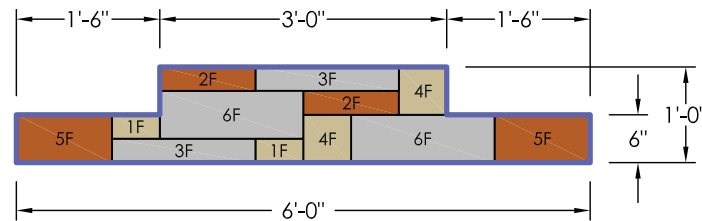
WALL PATTERNS - RETAINING

Belvedere Collection blocks are provided in six sizes. This gives you the flexibility to arrange the blocks in various configurations and create a custom look for your project. Here are some sample patterns to help you get started. These base patterns can be fit together in multiple ways to make walls of varying heights and lengths. Try these patterns and feel free to experiment with your own.

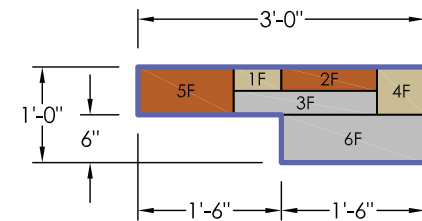
Notation: The blocks shown below are labeled to be consistent with the convention used throughout this guide. For example, 4F would indicate the front (or longer) face of block 4, and 2B would indicate the back (or shorter) face of block 2.



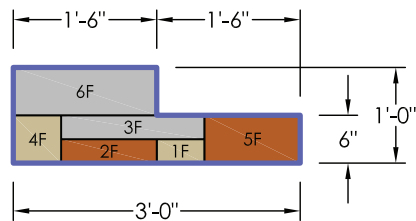
12" Top Left End



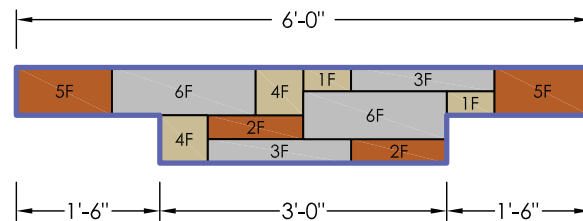
12" Pattern



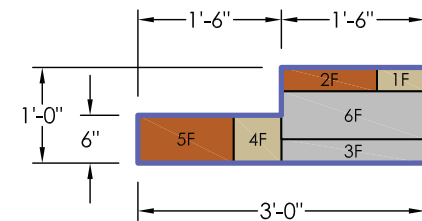
12" Top Right End



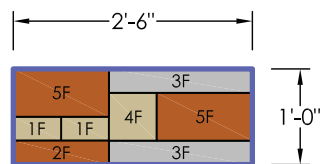
12" Bottom Left End



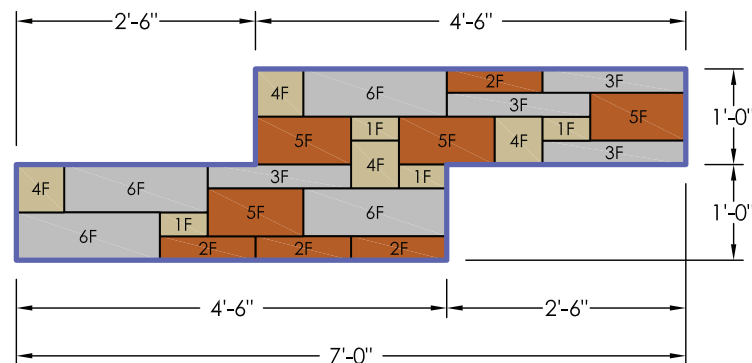
12" Pattern - Upside Down



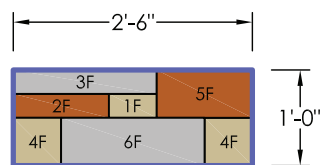
12" Bottom Right End



Corner Filler Pattern 1



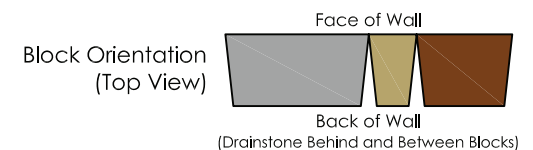
24" Pattern



Corner Filler Pattern 2

NOTE: These patterns are NOT required and are presented for reference only. They are most useful for long, straight sections of retaining walls.

NOTE: Retaining walls are typically constructed with the front face of the block exposed. The v-shaped notches which appear on the back of wall between adjacent blocks must be filled with drainstone.



WALL PATTERNS - RETAINING (CONTINUED)



This page shows wall layouts created from combining different sample patterns. These are examples only and are presented as aides for construction. You are welcome to adjust block placement as desired and not required to follow these layouts.

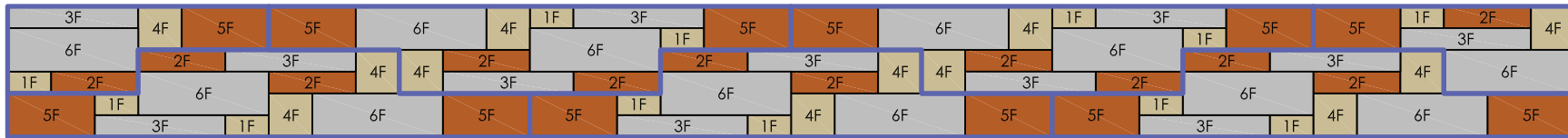
Notation: The blocks shown below are labeled to be consistent with the convention used throughout this guide. For example, 4F would indicate the front (or longer) face of block 4, and 2B would indicate the back (or shorter) face of block 2.

12" High Wall



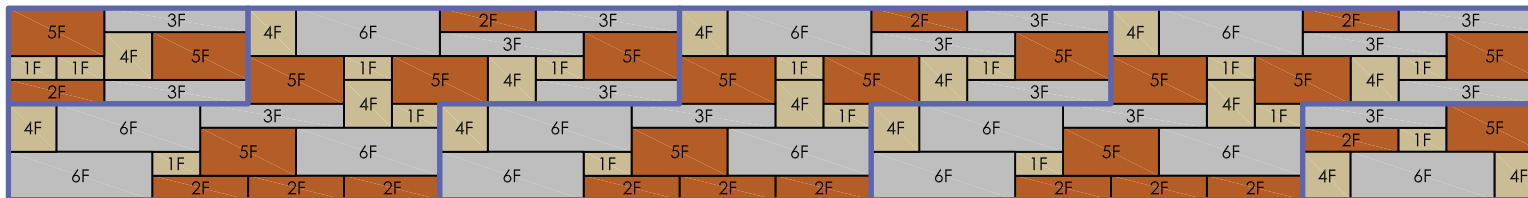
12" High x 13'-6" Wall Section Shown = 13.5 sft (1/2 Wall Pallet)

18" High Wall



18" High x 18'-0" Wall Section Shown = 27.0 sft (1 Wall Pallet)

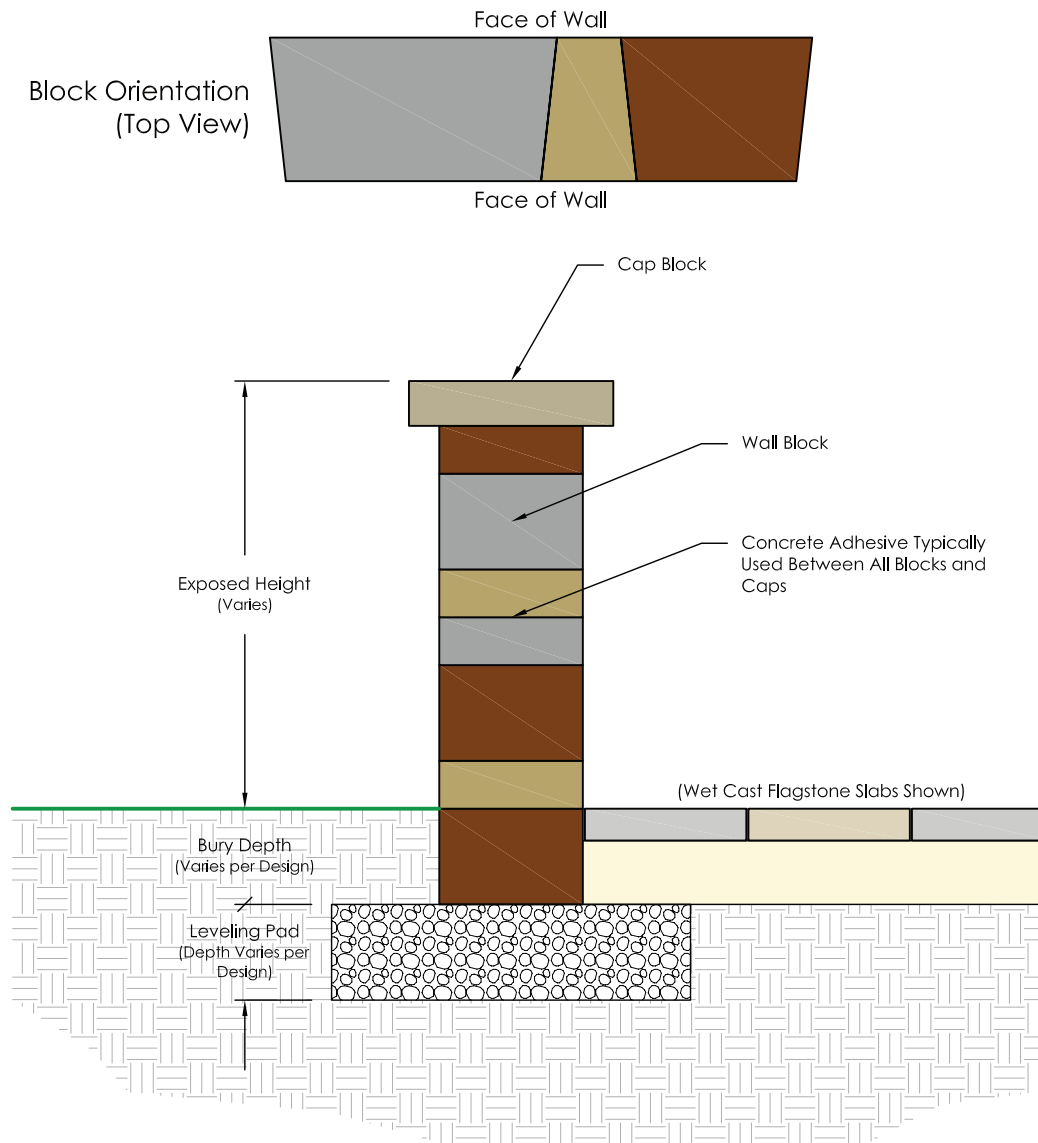
24" High Wall



24" High x 16'-0" Wall Section Shown = 32.0 sft (Approx. 1.2 Wall Pallets)

TYPICAL FREESTANDING WALL CONSTRUCTION DETAILS

This page shows typical construction details for Belvedere freestanding walls. These drawings are representative of major components required in wall construction. Belvedere freestanding walls are intended to be low walls (24" or lower) used in a garden or patio setting. Taller walls, walls intended to act as railings or barriers, walls constructed in other settings, or walls subject to applied loads will require project specific engineering.



Belvedere Freestanding Installation Notes

1. Footing excavation should be to the depth shown in the engineered plans for the wall, but at least 6" (150 mm) below the elevation of the bottom block in the wall.
2. Footing excavation width should be a minimum of 21" (530 mm), which will provide 6" (150 mm) in front of and behind the bottom block.
3. Existing soil sub-grade should be compacted to a minimum of 95% maximum dry density before foundation material is introduced. Sub-grade soil should be firm native soil, dry and stable. Consult a soils engineer if in doubt.
4. Place crushed stone or well-graded road gravel leveling pad material as specified in the wall design. Compact using a vibrator plate compactor.
5. Walls shall have the bottom course buried to the depth shown on the engineered design. Typically, walls are buried 4" to 6" (100 mm to 150 mm).
6. Place the bottom course of wall blocks. Take care to level the blocks both parallel and perpendicular to the wall. Adjacent blocks should be placed so the tapers on the sides are going opposite directions to provide a uniform wall face with no gaps on either side of the wall.
7. Place successive units to the desired wall height.
8. Typically, concrete adhesive is used between all blocks and the coping layer to help provide additional stability of the blocks.

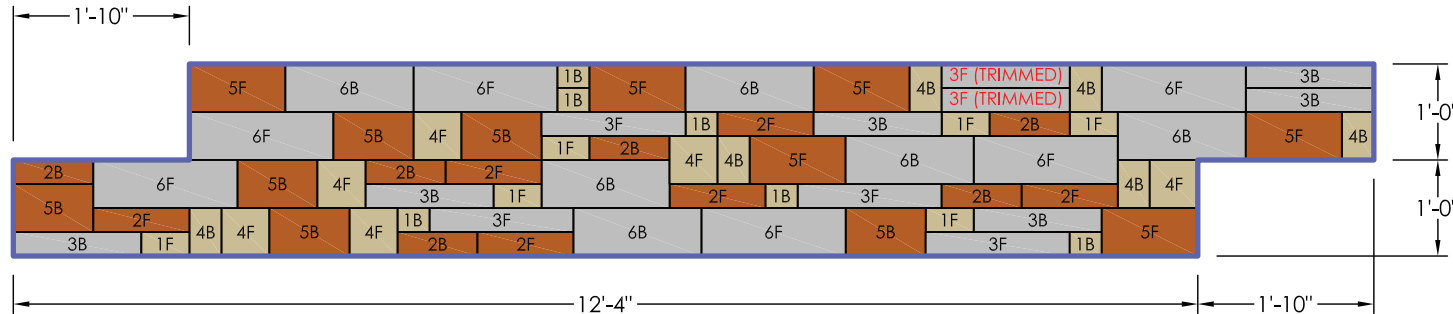
· This drawing is for reference only.
 · Final designs for construction for walls subject to any loading must be prepared by a registered Professional Engineer.
 · Block sizes and placement shown are for reference only. Individual Belvedere blocks will vary with installation pattern.

WALL PATTERNS - FREESTANDING



Belvedere Collection blocks are finished on front and back faces and tapered on both sides. When the blocks are installed with alternating front face and back faces of the blocks on the same side of the wall, the blocks fit tight together providing a continuous freestanding wall which has face textures on both sides. This page shows some sample patterns which can be fit together to make walls of varying heights and lengths. These are examples only and are presented as aides for construction. You are welcome to adjust block placement as desired and not required to follow these layouts.

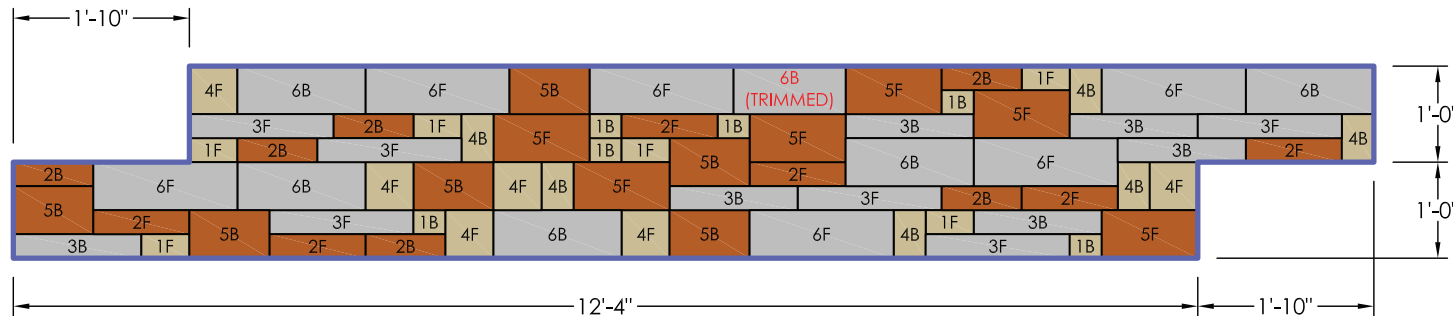
Notation: The blocks shown below are labeled to be consistent with the convention used throughout this guide. For example, 4F would indicate the front (or longer) face of block 4, and 2B would indicate the back (or shorter) face of block 2.



24" Pattern A

Wall Section Shown = 24.67 sft
(1 Wall Pallet)

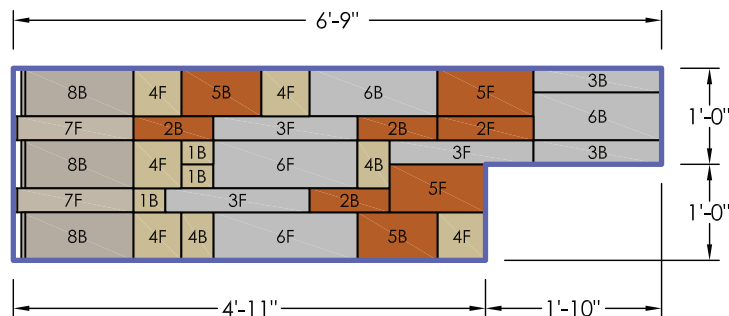
Note: 2" must be trimmed from (2) 3" blocks to make this pattern



24" Pattern B

Wall Section Shown = 24.67 sft
(1 Wall Pallet)

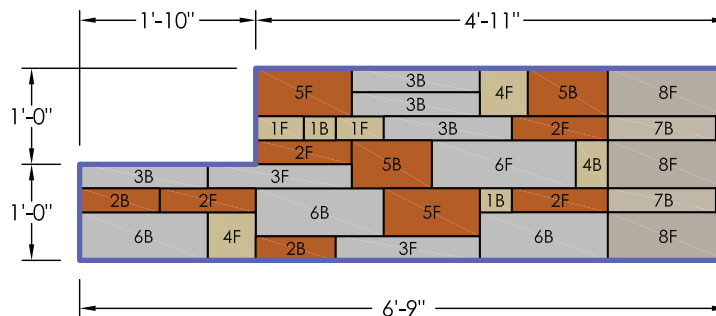
Note: 2" must be trimmed from (1) 6" block to make this pattern



24" High Vertical End - Left

Wall Section Shown = 11.67 sft (Approx. 1/2 Wall Pallet)

Note: Vertical End jogs in and out approximately 1" between blocks



24" High Vertical End - Right

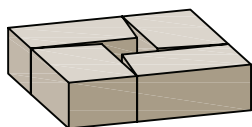
Wall Section Shown = 11.67 sft (Approx. 1/2 Wall Pallet)

Note: Vertical End jogs in and out approximately 1" between blocks

NOTE: These patterns are NOT required and are presented for reference only. They are most useful for long, straight sections of freestanding walls. Blocks can also be fit together on-site with select blocks trimmed as necessary to complete your wall.

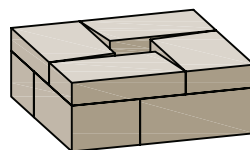
PILLAR CONSTRUCTION DETAILS

This page shows typical construction details for Belvedere pillars. Pillars make nice ends to freestanding walls, formal stair openings, stand-alone monuments, and other areas to enhance your Belvedere project. The basic steps of pillar construction are shown here. Feel free to expand on these ideas and bring your own creativity into creating a custom project.



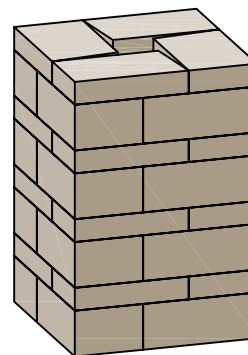
Step 1

Place (4) 3" or 6" high corner blocks with the taper facing into the center of the pillar.



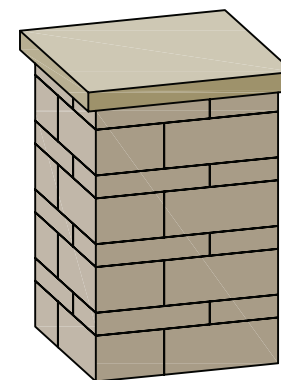
Step 2

Place the second row of (4) of the corner blocks with the taper facing into the center of the pillar. Typically if the first row is built with 6" corner blocks, the second row is built with 3" corner blocks.



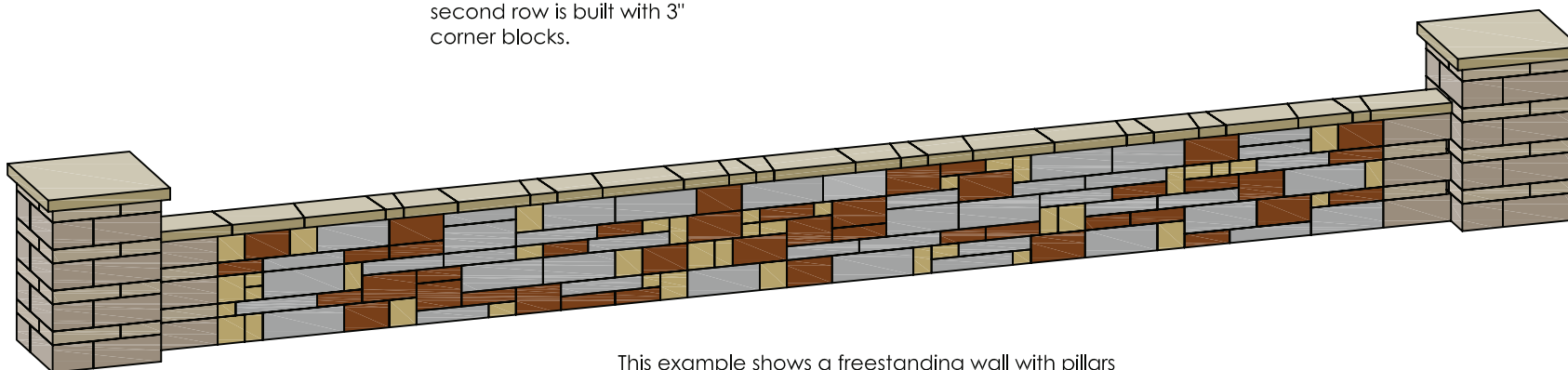
Step 3

Continue with subsequent rows to the desired pillar height. One pallet of corner blocks will make a 24" x 24" x 36" high column.



Step 4

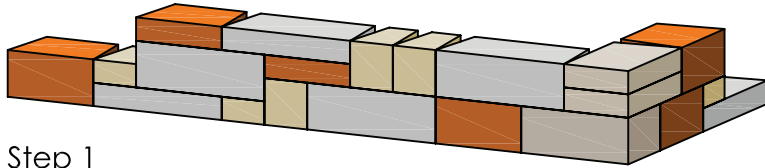
Place a column cap to finish the pillar. The column cap can be cored as needed for installation of a light.



This example shows a freestanding wall with pillars on each end. The wall can either be constructed flush with the pillars, or blocks trimmed to interlock the end of the wall with the pillar.

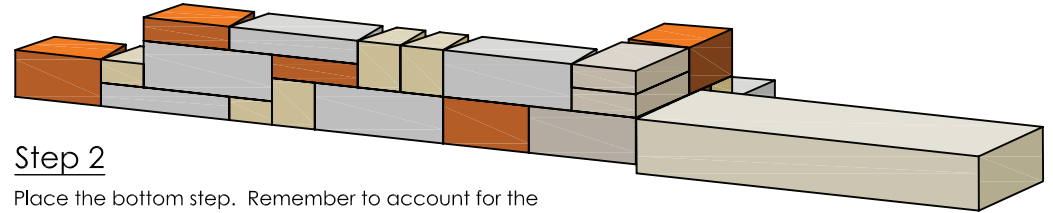
INSIDE STEPS

This page shows typical construction details for making stair openings into a wall using Belvedere blocks and Rosetta dimensional steps. Stairs are a focal point in any project and need to be constructed properly. With some advance planning, installation can be easy and look great.



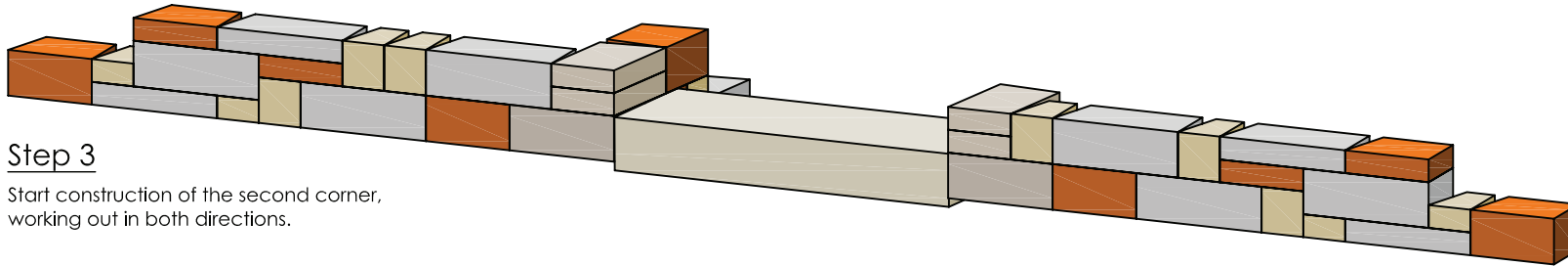
Step 1

Start construction of the first corner, working out in both directions.



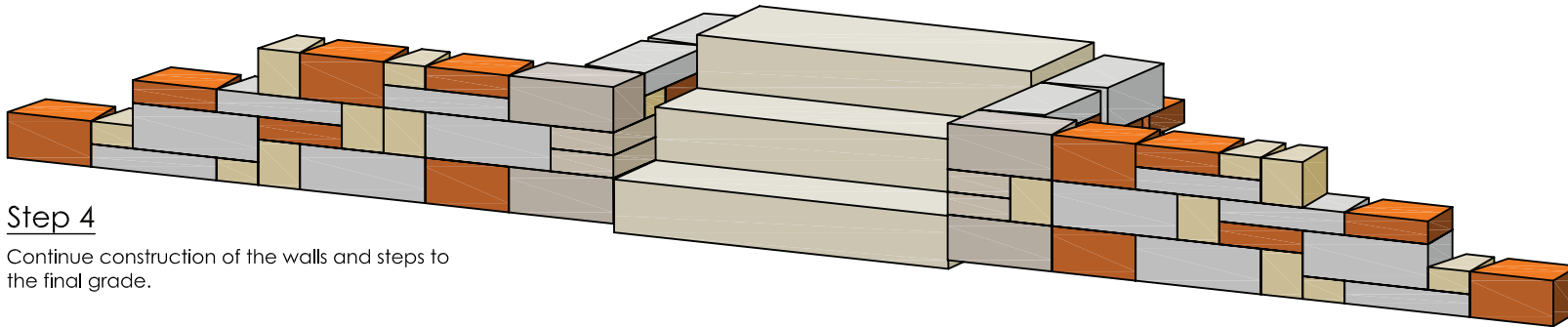
Step 2

Place the bottom step. Remember to account for the total rise of all steps and final cap elevations when setting the grade for the bottom step. Also remember to place the steps at a 1% - 2% grade to allow surface water drainage and avoid ponding on the steps.



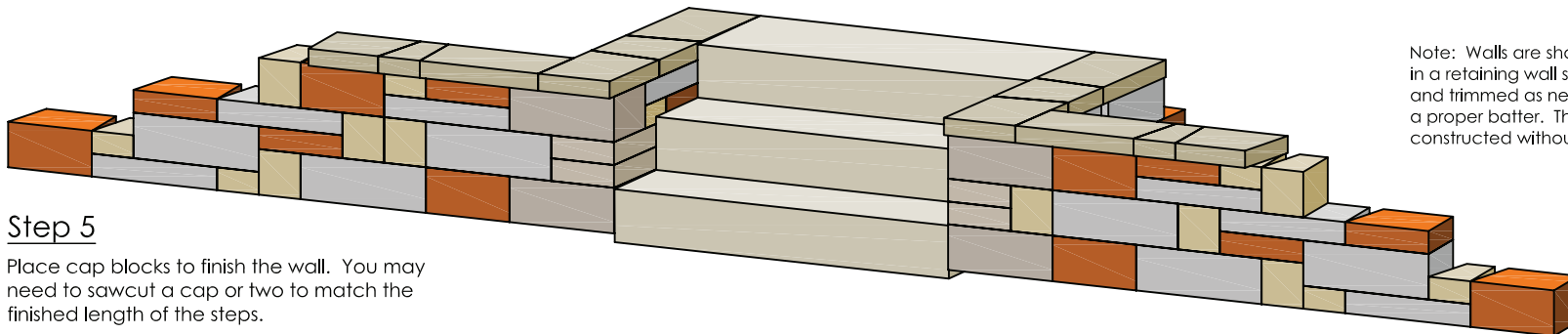
Step 3

Start construction of the second corner, working out in both directions.



Step 4

Continue construction of the walls and steps to the final grade.



Step 5

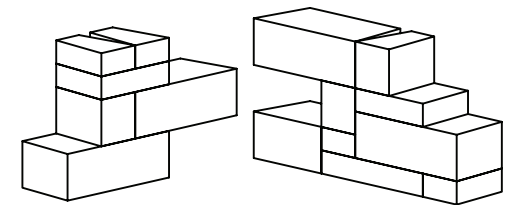
Place cap blocks to finish the wall. You may need to sawcut a cap or two to match the finished length of the steps.

Note: Walls are shown without batter for clarity. Blocks in a retaining wall should be adjusted slightly in place and trimmed as needed to allow wall construction with a proper batter. The inside wingwalls are typically constructed without batter to match the steps.

This page shows typical construction details for making 90° corners with Belvedere blocks. Some basic concepts are shown here. Plan to take some time to properly work corners into the larger retaining and freestanding wall patterns.

INSIDE CORNER

Bottom Block Hidden
(See Interlocking Corner Detail)

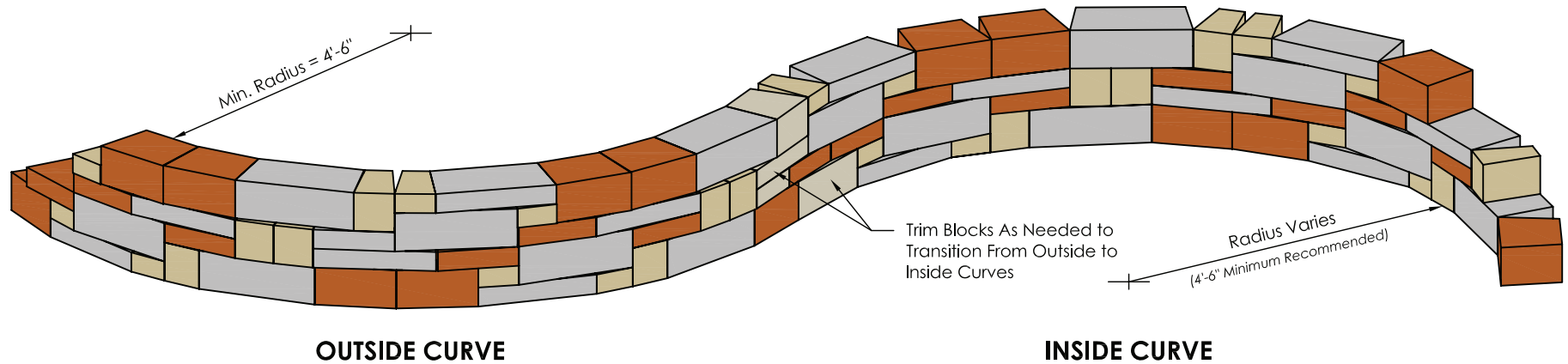


Place blocks in an overlapping, interlocking pattern at corner for added wall stability.

6-22-09

CURVED WALLS

This page shows typical construction details for making curved retaining walls with Belvedere blocks. The taper on the sides of the blocks allow for construction of a wide range of curves in both retaining and freestanding walls.

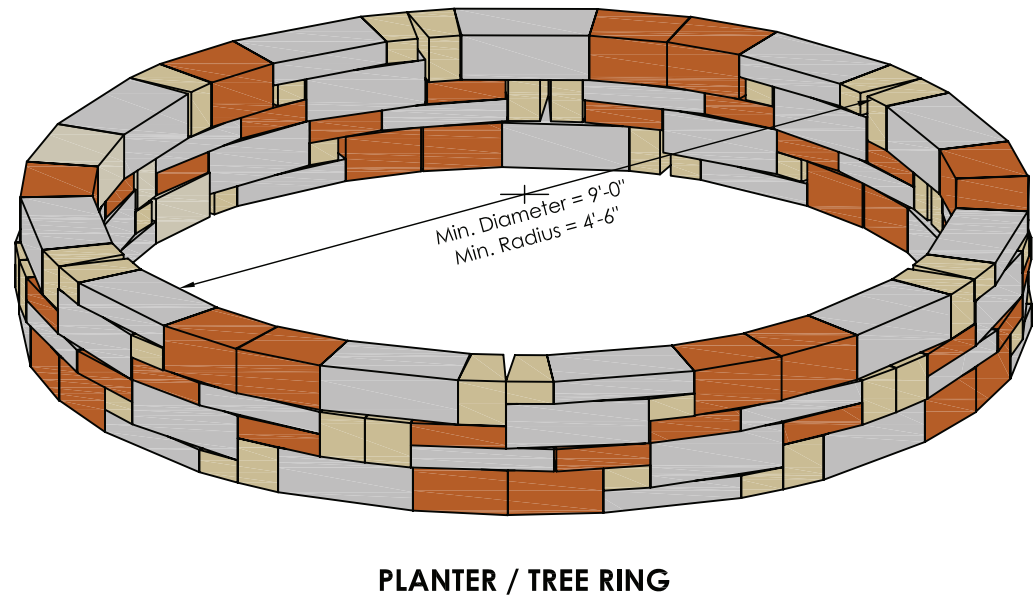


Notes:

1. These details show curved retaining walls.
2. Minimum radius curves are shown which can be constructed without sawcutting a significant number of blocks. Larger radius curves can be created by leaving a larger gap between blocks on the back side of the wall. The gaps must be filled with drainstone.
3. When retaining walls are constructed with a batter, the radius on outside curves becomes smaller with each course due to the block setback. For proper construction, the radius of the bottom course must be larger than the minimum radius so upper courses will have sufficient room for construction.
4. When retaining walls are constructed with a batter, the radius on inside curves becomes larger with each course due to the block setback.

Curved Freestanding Walls:

Curved freestanding walls can also be built. Typically, the blocks have to be field adjusted to make the desired curve. Front and back faces will alternate and blocks trimmed as needed to provide a tight fit between blocks with no gaps on either side of the freestanding wall.



Note: Walls are shown without batter for clarity. Blocks in a retaining wall should be adjusted slightly in place and trimmed as needed to allow wall construction with a proper batter.